ments. This latter paralytic form, like the deviations themselves, gradually disappears, to reappear only in the first stages of narcosis. Control experiments on the labyrinth and eighth nerve do not overthrow the conclusions regarding the cerebellar influence upon eye movements.

Experiments consisting of ablations of cortical and cerebellar areas simultaneously and in sequence seem to show that one lateral half of the cerebellum and the opposite cortical centre exert a combined influence tending to move the eye in one direction, while the other lateral lobe and the other hemisphere give movements in the opposite direction. These two influences are antagonistic: take away the whole of one and the other predominates; take away half of each and the remaining halves antagonize each other. The cerebellum seems further to exercise a direct action on the ocular muscles perfectly independent of cortical mediation.

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Obere Schleife und Hirnrinde. DR. MAX BIELSCHOWSKY. Neurolog. Centralblatt, Vol. XIV, p. 205.

Ein Beitrag zur Lehre vom Schleifenverlauf (obere, Rinden, Thalamusschleife). Von. DR. CHRISTFRIED JAKOB. Neurolog. Centralbl., Vol. XIV, p. 308.

Sur les connexions du ruban de Reil avec la corticalité cérébrale. M. et Mme. J. DEJERINE. Extrait des comptes rendus des séances de la Société de Biologie. Séance du 6 Avril, 1895.

The discussion on the central termination of the sensory pathways seems to come nearer a conclusion. There were practically two views represented: Flechsig and Hösel maintain that fibres which come from cells of the nuclei of Goll and Burdach and form the interolivary stratum and the fillet, terminate in the parietal region of the cerebral cortex. Von Monakow and Mahaim, on the other hand, state that there is no direct connection between the fillet and the cortex, but that the connection is indirect, by means of the optic thalamus.

Bielschowsky examined two dogs' brains, in which Professor Goltz had removed one hemisphere with the corpus striatum in one case and both hemispheres with the corpora striata in the other. The first dog lived two years and five months after the operation, the second nine months after removal of one and two months after removal of the other hemisphere. In both dogs, the optic thalamus was not injured, but showed secondary atrophy (just as in Von Monakow's experiments); the fillet, however, was neither atrophic nor degenerated; hence the conclusion that the fillet is merely a connection between the nuclei of Goll and Burdach and the optic thalamus, and that a second nerve cell is needed for the connection between the optic thalamus and the cortex.

The greatest and most valuable material has been published by M. and Mme. Dejerine. They have no less than nine cases in which the fillet was involved, and nineteen cases in which the fillet might have been involved, if Flechsig and Hösel's views were correct. Their cases allow the following conclusions:

1. In two cases with a lesion of the nuclei of Goll and Burdach, there is (ascending) degeneration of the fillet; the degeneration cannot be followed beyond the subthalamic region and the inferior part of the optic thalamus.

2. In three cases the fillet is destroyed in the region of the pons. The consequence is a descending degeneration, involving the inter-

olivary stratum on the same side and the arcuate fibres and nuclei of Goll and Burdach of the opposite side,—and an ascending degeneration, which can be followed only as far as the anterior corpora quadrigemina and the inferior part of the optic thalamus, but leaves completely intact the fibres passing through the lenticular nucleus, the nucleus of Luys, the globus pallidus and the commissure of Meynert.

3. In four cases lesion of the region of the optic thalamus is followed by a slight atrophy of the mesial fillet, diminishing downwards as we approach the nuclei of Goll and Burdach. This atrophy belongs in the category of "atrophic cellulipète," described by Forel. There is no reason to believe that the cells of the fibres that atrophy apparently downward must be located in the thalami; at any rate, most of the fibres of the fillet come from the cells of the nuclei of Goll and Burdach.

4. Among the nineteen cases of lesion of the motor and parietal area there is especially one which seems very conclusive. The whole external aspect of the left hemisphere and the orbital surface of the frontal lobe were softened; the central ganglia were, however, not involved. The patient had had right hemiphlegia with total aphasia for eleven years. The secondary degeneration involved: the radiations of the thalamus, of the internal and external geniculate body, the fibres to the pons and medulla, the pyramidal tract, etc., a total degeneration of the internal capsule, of the crus cerebri, the locus niger and part of the red nucleus. With all this, the fillet was intact and also the aura lenticularis. A drawing in Dejerine's *Anatomie des centres nerveux*, Vol. I, p. 180, gives the whole plan of the sensory pathways as it follows from his cases.

Dr. Jakob's paper appeared before Dejerine's and adds another case in favor of Von Monakow's view; his remark, that the central sensory nerve cell might be located in the globus pallidus, cannot be upheld by facts, and does not invalidate the view of Von Monakow and Dejerine, which may be summed up as follows:

1. The periphery sensory element is a spinal ganglion cell.
2. The first central sensory nerve cell is a cell of the nuclei of Goll and Burdach, which helps in forming the fillet of the opposite side, and ends in the optic thalamus.
3. The higher central sensory nerve cell is situated in the optic thalamus and sends its process to the cortex of the parietal lobe.

ADOLPH MEYER.

Beiträge zur Kenntniss des Reichtums der Grosshirnrinde des Menschen an markhaltigen Nervenfasern. THEODOR KAES. Archiv für Psychiatrie, XXV, 695-758 Tafl. XIII, XIV, Berlin, 1893.

Ueber den Markfasergehalt der Grosshirnrinde eines 1 1-4 jährigen männlichen Kindes. THEODOR KAES. Jahrbücher der Hamburg Staatskrankenanstalten, IV, 1893-94. Hamburg und Leipzig, Leopold Voss, 1896.

Ueber Grosshirnrindenmasse und über Anordnung der Markfasersysteme in der Rinde des Menschen, zugleich ein Beitrag zur Frage: Unterscheidet sich die Rinde des Kulturmenschen von den niederen Racen in Bezug auf Kaliber, Reichthum und Anordnung der markhaltigen Nervernfasern? THEDOR KAES. Wiener Med. Wochenschr., 1895, No. 41 and 42.

Every attempt to discover the physical basis of intelligence in the gross characters of the brain, its size, weight, form or convolu-